DOCUMENT RESUME

ED 363 303 IR 016 422

AUTHOR Philleo, Tom

TITLE Icon Images in HyperCard: An Exploration of Visual Concepts with Middle School Students.

PUB DATE 93

NOTE 6p.; In: Art, Science & Visual Literacy: Selected Readings from the Annual Conference of the International Visual Literacy Association (24th, Pittsburgh, PA, September 30-October 4, 1992); see IR 016 399. Illustrations may not copy well.

PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.

DESCRIPTORS *Computer Graphics; *Computer Software Development; Data Collection; *Hypermedia; Junior High Schools; Junior High School Students; Middle Schools; Pictorial Stimuli; Research Methodology; Research Needs; Student Reaction; Visual Discrimination; Visual Literacy; *Visual Perception

IDENTIFIERS Apple Macintosh; HyperCard; *Middle School Students; *Screen Format; Visual Imagery

ABSTRACT

The purpose of this project was to investigate, in an informal and exploratory manner, the reactions of middle school students to unfamiliar symbols used as computer screen icons. The project focused on discovering a means to address the following issues: (1) the appearance of buttons containing text compared to those with graphics; (2) the relationship of graphic buttons to user curiosity; (3) how close the link between the graphic and the information must be; and (4) whether users bypass buttons with unfamiliar graphics. HyperCard for the Macintosh computer was used to produce a presentation program of general information about the building and flying of radio-controlled model airplanes. Middle school students were asked to review the program and discuss their opinions about its quality and effectiveness. One group was asked what they thought of the icons after they had finished using the presentation; the other group was interrupted and questioned as soon as unfamiliar icons appeared. The program recorded data on the number of times icons were used. Since the project was exploratory, no formal conclusions were drawn from the data except that the use of hypermedia software to develop a short line of inquiry turned out to be successful. Development of the presentation was simple, and a wide variety of questions could be explored. (KRN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 363 303

Icon Images in HyperCard: An Exploration of Visual Concepts with Middle School Students

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

by
Tom Philleo

The purpose of this project was to investigate, in an informal and exploratory manner, the reactions of students to unfamiliar or uncommon symbols used as computer screen icons. HyperCard for the Macintosh computer was used to produce a presentation program of general information about a special interest recreational activity. The activity chosen was the building and flying of radio controlled model airplanes. Middle school students were asked to review the program and discuss their opinions about its quality and effectiveness. A record of student activity within the program was available to the interviewer.

Since this project was primarily concerned with the unique qualities of computer hypertext or hypermedia capabilities, it might be appropriate to spend some time reviewing the particular characteristics of HyperCard for those who may not be familiar with it. HyperCard, as its name implies, allows users to view or develop informational presentations or collections of data on computer simulated cards. The card metaphor allows those interested in creating programs easy access to the development process due to its association with the familiar concept of a stack of file cards. After designing a format for a stack of cards, developers may enter text information to be displayed on each card in areas called fields, draw or import graphics, and create *buttons* for moving from card to card. Figure 1 shows a typical symbol or icon used in HyperCard as a button. It is the ability to create buttons which gives this program its unique capabilities and qualifies it as a hypermedia product. Although in many applications the screen cards can be viewed in a linear progression, it is also possible to create presentations in which users can jump through a stack of cards viewing only those cards which are related by a common theme or thread.

Buttons serve many different functions in HyperCard including activating sounds, providing help, or displaying a new card. When a button causes the display of a new card, this is sometimes thought of as navigation. Clicking the mouse pointer on a navigation button sets the user on a particular course through the program. Such courses are usually not irreversible because most hypertext programs allow the user to return to a starting place at any time. Because of this capacity, navigation through such a program can become an exploration in which the user investigates the contents of various

"PERMISSION TO REPRODUCE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY
Alice D. Walker
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

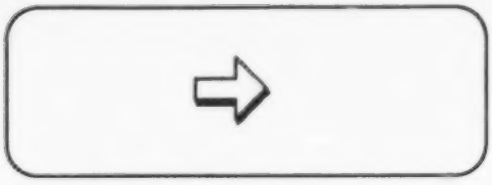


Figure 1. Typical button icon.

cards and can continue on a path of discovery about related information or return to the beginning.

When creating buttons it is possible to keep a record of how often they are pressed. It is this feature of HyperCard that allows anyone interested in testing individual responses to presentations to track a user's choices and determine what areas (via buttons) were explored. For example, buttons representing areas of information about a particular subject might be created for a screen display. If the topic were the Vietnam war and various buttons were displayed indicating that each would provide more information in a specific area such as dates, biographies, or geography user interest in these areas could be measured by comparing the number of times each button was chosen.

The purpose of this particular exploration was to investigate middle school students' responses to buttons which contained small graphic representations instead of text descriptions. Since buttons can be utilized as gateways to information, their design may be important in creating programs which encourage and foster curiosity, interest, and enthusiastic exploration. Several questions were raised about the design and appearance of buttons. Do buttons containing one or two words have a "flat" appearance when contrasted to buttons containing graphic elements? When buttons containing graphic clues to the information they represent are displayed, what is their relationship to viewers' curiosity? How close must the link between graphic and information be? Might program users bypass buttons with unfamiliar graphic representations?

In order to discover a means for answering these questions a Hypercard stack was created covering a topic with which middle school students were unlikely to be familiar. Unfamiliarity was considered important so that students' knowledge of a subject area not interfere with their exploration choices. Consequently, very little of the information in the presentation was of a nature which might cause students to think "I already know about that" and therefore avoid choosing a button because of a perceived familiarity.

Figure 2 shows the screen display that is central to the navigation of the presentation. There are three possible courses to take from this screen as represented by the three buttons, "Airplanes", "Radios", and "Learning to fly". In addition there is a button to click when finished. After viewing text, animation, or pictures relating to one of the three topics, students are returned to this screen.

Each of the three topic sections contain other buttons which provide additional information, begin an animation, or return the user to the beginning. There are twenty-two buttons in the entire presentation and a special card which can display how many times each button has been pressed. Access to this card was limited to the study supervisor.

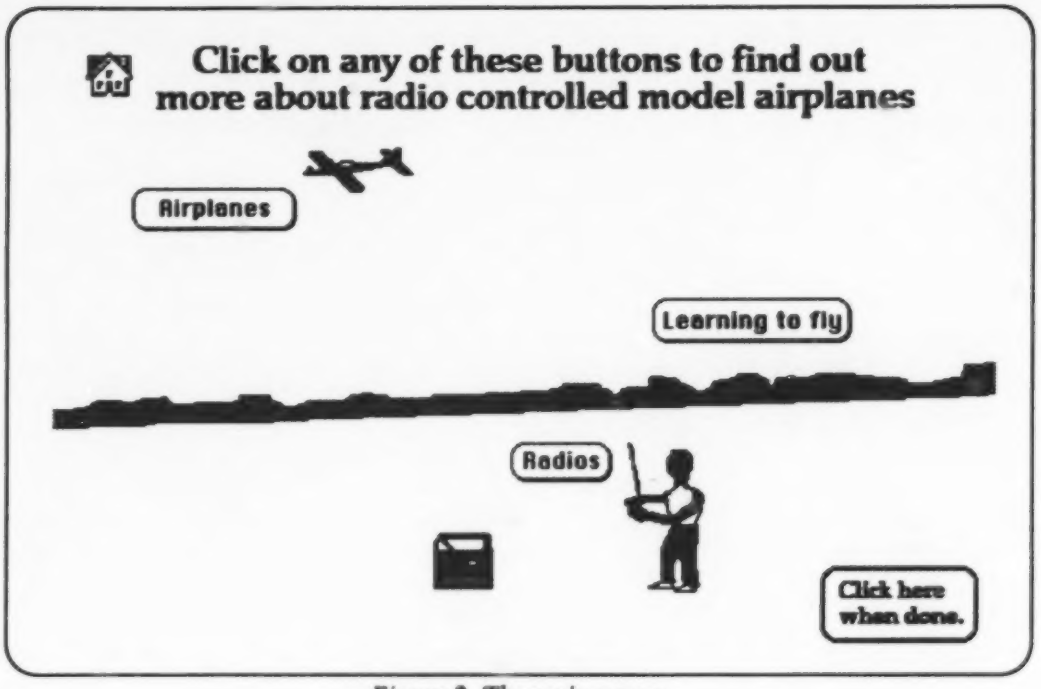

Click on any of these buttons to find out more about radio controlled model airplanes
Airplanes
Learning to fly
Radios
Click here when done.

Figure 2. The main screen.

The presentation was viewed by three groups. First, a brief formative evaluation was done using a group of six seventh and eighth grade boys and girls. The program was installed on a computer in the school media center. A glass partition separates a small work area from the rest of the room and the computer was set up in that work area. Students were chosen from an adjacent study hall and given basic information about the project which emphasized that it was the program itself which was being tested and that students should only do what interested them. In addition to time spent at the computer and the number of times each button was pressed being recorded, students were interviewed briefly about the general appeal and comprehensibility of the presentation. As a result of this procedure, it was determined that students generally enjoyed viewing the program, were not confused about how to navigate via the buttons and, as evidenced by the record of button presses, seemed willing to explore most areas of information.

In the second and third groups, students were shown the presentation under the same conditions described above but the presentation was altered. One of the cards (figure 3) was redesigned so that three buttons, which provide additional information about three topics related to a model plane, contained small drawings intended to relate to the ideas and information to be presented. In the second group, students were given as much time as they wished to explore the program. After completion they were shown a paper copy of the screen containing the picture buttons and asked to relate what they first thought when presented with this screen. They were then asked what they thought each button represented and what

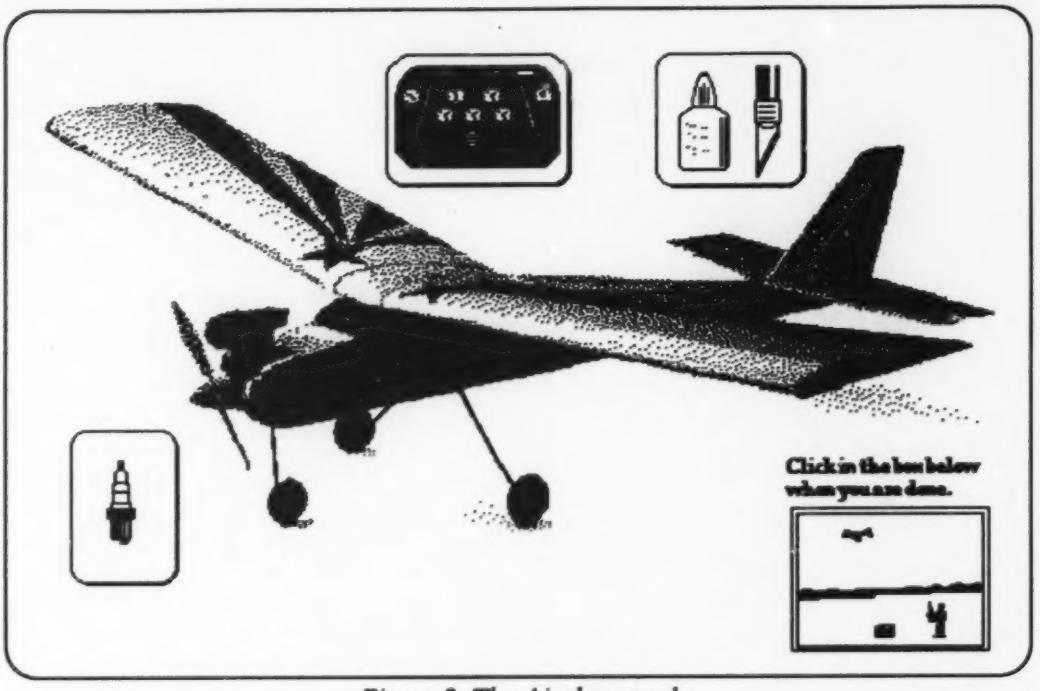
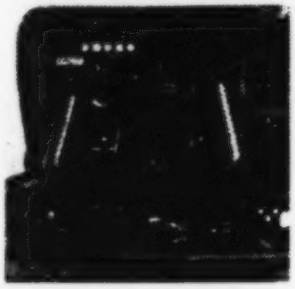


Figure 3. The Airplane card.

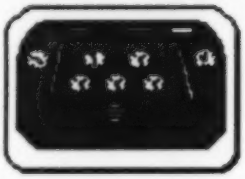
they thought might happen if they chose it. Since their answers were naturally affected by the fact that most of them had already seen what the result of choosing each button was, it was decided to interrupt students at the point at which they first encountered the atypical screen and ask them what they thought each of the three button pictures represented and to predict what they thought might happen if they were to click on each one of the graphic buttons.

The results of this activity were examined in two ways. First, the number of button presses was tallied. Results showed several interesting trends. For example, approximately half of the students did not explore information about the various parts of a model engine. On the other hand, a button which activated an animated demonstration of the control levers of a radio was clicked an average of two times and all students chose to click it at least once. Since this project was an exploratory study and not rigorous research, no formal conclusions could be drawn from this data except that this means of recording students' reactions to screen presentations might be a viable way of conducting meaningful studies.

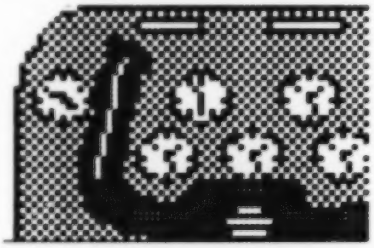
Interviews with students provided insights into questions concerning the effectiveness, appeal, and clarity of the graphic buttons. When asked what they thought the buttons meant, a majority of the students recognized the hobby knife, the glue bottle, and the cockpit and were able to accurately predict what might happen when each button was clicked. Not surprisingly, the spark plug was less able to elicit an accurate response. Most students did not know what it was and therefore had no idea



Scanned image of photograph.



Button: actual screen size.



Enlargement of button icon.

Figure 4

what it might lead to. An interesting question here is whether or not that arose from lack of familiarity with spark plugs or from the poor quality of the representation. Figure 4 shows the transformation of the cockpit to a screen button. In the enlarged view it is easy to see how the low resolution of the screen affects the ability of this particular application to create accurate artwork. The surprise here is that students were able to relate at all to these crude, jagged-edged icons. An airplane cockpit can hardly be thought of as a common object. One would guess that only a minority of 12 and 13 year old students have ever actually been in a cockpit. Is it the preponderance of video and the exposure of children to a wealth of visual data that makes them so visually erudite? None of the students questioned mentioned the key word—yoke—that distinguishes this picture from the control panel of a tractor or dozens of other types of modern equipment. They may not have known its name but they knew what it was. It was also discovered that the students who did not recognize what the button graphics represented tended not to choose them. Work may need to be done in this area to accurately determine the effect of pictorial buttons as used in hypermedia.

The use of hypermedia software to develop a short line of inquiry turned out to be entirely successful. Development of the presentation was relatively simple and a wide variety of questions could be explored. With an increasing reliance on mouse pointing in educational software it would appear that there are many questions relating to screen design that need to be answered and the use of a product such as HyperCard may be an excellent method for approaching such questions.